

CA

111

Production of alanine in a plant by direct amination of pyruvic acid. V. L. Kravtsovich and A. A. Bundel. *Doklady Akad. Nauk S.S.R.* 74, 107-10 (1950).—An enzyme prepn. was isolated that catalyzes alanine formation from pyruvic acid and NH_3 . Etiolated turnip sprouts were extd. with phosphate buffer (pH 8.67) in presence of Na_2CO_3 with sand as the grinding aid. Addn. of NH_3 pyruvate to the ext. gives a rapid formation of alanine in the soln. after incubation at 37° ; at 4° the reaction is slower. The enzyme was concd. by aq. extn. of the sprouts, followed by pptn. with $(\text{NH}_4)_2\text{SO}_4$ and dialysis of the ppt. against cold H_2O . No further characterization is reported at this time.

G. M. Kosolapoff

CA

12

Content of hydroxymethylfurfural in bread and hops.
V. I. Kozlovich and R. R. Tokareva (A. N. Bakh Institute
 Inst., Acad. Sci. U.S.S.R., Moscow). *Doklady Akad.
 Nauk S.S.S.R.* 74, 533 5(1950). -- Hydroxymethylfurfural
 (I) is present in the following quantities: none in bread from
 72% wheat flour, 2.2 mg. % if 5.5% sugar is added to the
 flour, and 2.5-14.4 mg. % if 3-10% wheat hops is added
 to the flour. Bread from 80% wheat flour has no I, but
 90% flour gives bread with 18 mg. % I. Addn. of sugar to
 flour gives higher content of I. Red rye hops of high qual-
 ity contain 37-40 mg. % I. I belongs therefore to the im-
 portant flavoring materials of bread. The detn. of I con-
 sists of aq. extn. overnight, neutralization with *N* NaOH,
 extn. for 48 hrs. with Et_2O , drying the ext. with Na_2SO_4 ,
 concn. in C_6H_6 stream on water bath, acidification of residue
 with 10% HCl and addn. of phloroglucinol in 10% HCl,
 then weighing the pptd. phloroglucide of I.

G. M. Kozlovich

KRETOVICH, V. I.

Agriculture

Storage of grain. TRYASVYATSKIY, L. A., Pod. red. V. I. Kretovicha, 2 izd, Moskva, Gos. izd-vo tekhn. i ekon. lit-ry po voprosam zapotok, 1951.

9. Monthly List of Russian Accessions, Library of Congress, June 1952 ~~1953~~, Uncl.

1. KRETOVICH, V. L., EUNDEL', A. A. and USPENSKAYA, ZH. V.
2. USSR (600)
4. Amino Acids
7. Transformation of dicarboxylic amino acids in the sprouting and maturing of grain.
Biokhim.zerna No. 1, 1951.

9. Monthly List of Russian Accessions, Library of Congress, March 1953. Unclassified.

CA

Bolamy 11-0

Interrelation of factors that determine the energy of respiration of grain. A. P. Prokhorova and V. L. Kretovich (A. N. Bakh Biochem. Inst. and Ministry Health, Moscow). *Biokhimiya Zerna*, Akad. Nauk S.S.S.R., Zhurnal 1, 34-42(1951).--The viability of grain and associated phenomena depend upon interrelation of many factors whose effects on respiration of grain mass must be considered in connection with all the prevailing conditions. Thus, at 18° respiration of wheat grain (expressed as elimination of CO₂ per given wt. of grain) is relatively const. in the range of moisture content from 11 to about 14%; higher moisture content leads to very rapid linear climb of respiration rate. Activity of wheat-grain catalase declines steadily with time when kept at 65°, but at 45° a mass of grain mass causes after some 40 hrs. Const. ventilation of grain mass causes a pronounced rise of respiration in comparison with unventilated mass. Incompletely ripened wheat grain shows over a prolonged storage period a gradual decline of respiration, followed by a mild rise after some 1-25 years; wholly ripened grain shows a nearly const. level over 5 years. In the interval 0-25° increased temp. greatly accelerates respiration; max. rate occurs at 50-65° and is raised very much by increased moisture content in the range 14-22%; the 22% moisture gives a respiration max. some 100% greater than that found with 18% moisture. G. M. Kosolapoff

2A

Biology 11-12

Biochemical, colloidal-chemical, and technological study of ripening of rye. V. L. Kretovich, R. R. Tokareva, I. S. Petrova, T. V. Druzhkova, A. G. Kul'man, R. A. Brannopol'skaya, L. Ya. Amerman, and N. I. Smolina (A. N. Bakh Institute, Moscow). *Biokhimiya Zerna, Abad. Nauk S.S.S.R., Zhurnik* 1, 93-103 (1951).--During ripening of rye grain there occurs a progressive decline of nonprotein N, of enzymic hydrolytic reactions, of enzymic cleavage of proteins, much as it is observed in wheat. Susceptibility of starch to enzymic cleavage is reduced as is amylolytic activity, detd. in autolyzed samples and in ex. exts. Ripening of the grain on the plant causes a lowering of hydrophilic properties of the grain colloids, possibly due to processes of aggregation; it is characterized by lowered ability to bind water, lowered quantities of colloidal matter present that are peptized by H_2O , and a substantial rise of the rate of filtration of dil. suspensions. Ripening after harvesting causes a further decline of hydrophilic properties. Rye grain harvested at wax-ripe stage gives after proper drying a 90% yield of satisfactory bread. Even slightest signs of sprouting lower the quality of bread obtainable from the rye grain.
G. M. Kosolapoff

CA

Foodv-12

Biochemical control of procedures of drying of rye R. R. Tokareva and V. L. Kretovich (A. N. Bakh Biochem. Inst., Moscow). *Russkaya Zhurn. Akad. Nauk S.S.S.R., Seriya 1*, 104-113(1951).—Although lowered catalase activity of rye grain signifies poor quality of bread prepd. from such grain, there appears to be no correlation between catalase activity and viability of the grain. The following method is suggested for control of grain quality for detection of improper drying. An aq. ext. of the ground flour is treated with H_2O_2 and the vol. of O_2 evolved per 5 min. is detd. Improperly dried grain yields (per 5-g. sample) 0.5-1.0 ml. O_2 ; grain that had not been subjected to flame-drying yields 1-3 ml.; this indicates unimpaired catalase function. G. M. Kosolapoff

Mucins of rye grain and their technological significance
 V. I. Kretovich and I. S. Petrova (A. N. Bakh Biochem. Inst., Moscow). *Biokhimiya Zerna, Akad. Nauk S.S.S.R., Sbornik 1*, 145-61 (1951). --Mucins, obtained by pptn. with EtOH or Me₂CO, form a colorless mass that swells in H₂O and dissolves slowly, forming viscous gels; some 100% increase in vol. occurs during hydration. The chem. compn. is that of polysaccharides, some 70% of which are pentoses. Purified mucins are devoid of free carbonyl groups and do not reduce Fehling soln., but do so after acid hydrolysis. Before hydrolysis they are levorotatory, but become dextrorotatory after hydrolysis, yielding mixts. of arabinose and xylose as principal constituents; some 7-8% methylpentoses and 2% galactose has been found in some specimens. Viscosity of aq. solns. of the mucins is higher than that of corresponding solns. of gelatin, starch paste, and egg albumin. Their viscosity is increased by addn. of KBrO₃ and is independent of pH. The mucins retard swelling of starch and lower its susceptibility to attack by enzymes and affect the phys. properties of dough and bread in accordance with the above data. G. M. Kusolapoff

PROKHOROVA, A.P.; KRETOVICH, V.L.

The Postharvest Ripening as a Factor of Energy in Grain Respiration

Dok AN SSSR, Vol 80, No 1, 1 Sep 51, p. 77

CA

Formation of aspartic acid in plants from oxalacetic acid and ammonia. V. L. Kretovich, A. A. Bundel, and K. B. Aseeva (A. N. Pash Biochem. Inst., Moscow). *Doklady Akad. Nauk S.S.S.R.* 80, 223-8 (1951).--Aspartic acid forms in crushed etiolated pea sprouts when incubated in phosphate buffer (pH 5.6 and 8.7) with oxalacetic acid and NH_4OH for 12-18 days. Similar results are obtained by infiltration of NH_4OH into living pea sprouts. The synthesis is enzymic in nature since an enzyme prepn. made from the sprouts by the method of Kretovich and Bundel (*C.I.* 45, 2064a) is similarly active; the enzyme prepn. consists of 2 fractions (pptd. by 30% or 70% $(\text{NH}_4)_2\text{SO}_4$) both of which are active. G. M. Kowolansoff

KRETOVICH, V. L.

USSR/Chemistry - Analytical

21 Sep 51

"Quantitative Chromatographic Determination of Volatile Aliphatic Acids," V. L. Kretovich, T. V. Drozdova, I. S. Petrova, All-Union Inst Bread-Baking Ind, Min of Food Ind USSR, and Inst of Biochem imeni Bakh, Acad Sci USSR

"Dok Ak Nauk SSSR" Vol LXXX, No 3, pp 409-412

Butyric, acetic and formic acids were 1st identified qualitatively in an adsorption column prep'd in the laboratory, and then the acids were quantitatively removed from the column and titrated. The method is applicable to food products and was used for the detn of the above acids in rye bread and malt.

210T37

DUBININ, M.M., akademik, otvetstvennyy redaktor; GAPON, Ye.N.; GAPON, T.B.;
 ZHYPAKHINA, Ye.S.; RACHINSKIY, V.V.; BELEN'KAYA, I.M.; SHUVAEVA, G.M.;
 ROGINSKIY, S.Z.; YANOVSKIY, N.I.; FUES, N.A.; KISELEV, A.V.; NEYMARK, I.Ye.;
 SLINYAKOVA, I.B.; KHATSET, F.I.; LOSEV, I.P.; TROSTYANSKAYA, Ye.B.;
 TEVLINA, A.S.; DAVANKOV, A.B.; SALDADZE, K.M.; BRUMBERG, Ye.M.; ZHIDKOVA,
 Z.V.; VEDENEVA, N.Ye.; NAPOL'SKIY, S.A.; MIKHAYLOVA, Ye.A.; KAZANSKIY, B.A.;
 RYABCHIKOV, D.I.; SHEMYAKIN, F.M.; KRETOVICH, V.L.; BUNDEL', A.A.; SAVINOV,
 B.G.; VENDT, V.P.; EPSHTEYN, Ya.A.

[Research in the field of chromatography transactions of the All-Union
 Conference on Chromatography, November 21-24, 1950] Issledovaniya v oblasti
 khromatografii; trudy Vsesoiuznogo soveshchaniya po khromatografii, 21-24
 noiabria 1950 g. Moskva, Izd-vo Akademii nauk SSSR, 1952. 225 p.
 (MLRA 6:5)

1. Akademiya nauk SSSR. Otdelenie khimicheskikh nauk.
 (Chromatographic analysis)

L.I. VILIN, V.I.

ANALIZA i t.d. Stroenie Mol. Interf. i t.d.
(Problems in industry and agriculture; conference on
proteins) Teki v promyshlennosti i sel'skom khoz-
yaystve. (Iz r. d. A.I. Gureva, V.I.
Kryukova i t.d. Izdaniye) Moskva, Izdatel'stvo
SNT, 195 . 322 p.

100

KRETovich V.L.

Kretovich, V. L.: Osnovy Biokhimii Rastenii (Elementary Biochemistry of Plants). Moscow: Sovetskaya Nauka. 1952. 486 pp.

1. KRETOVICH, V. L - TOKAREVA, R. R. - PETROVA, I. S. - DEOZDOVA, T. V.
KUL'MAN, A. G. - BRANOPOL'SKAYA, R. A. - AUYERMAN, L. YA. - SMOLINA, N. I.
2. USSR (600)
4. Wheat
7. Biochemical, colloid-chemical, and technological studies of the
maturing of wheat. Biokhim.zerna no. 1, 1952
9. Monthly List of Russian Accessions, Library of Congress, March 1953, Unclassified.

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Biology 11-D

Transformations of dicarboxylic amino acids in ripening and sprouting of grain. V. L. Kretovich, A. A. Runchik, and Zh. V. Uspenskaya (K. N. Bakh. Biokhem. Inst., Moscow). *Biokhimiya Zern, Akad. Nauk S.S.S.R. Seriya 1*, 43-64 (1952).—The employment of the chromatographic technique described previously (C.A. 43, 3746) for detn. of dicarboxylic amino acids permitted a study of changes in aspartic and glutamic acids in ripening wheat and rye grain and in sprouting wheat and kidney bean in the dark. During ripening the amt. of dicarboxylic amino acids in the grain declines; in ripe grain it reaches 0.95% of dry wt. (calcd. as glutamic acid). There is no significant difference in the content of such acids in wheat and rye; kidney beans contain some 8 times as much dicarboxylic acids. The cotyledons and sprouts of the kidney bean contain much higher levels of these acids than do the endosperm and sprouts of wheat. Sprouts have larger amts. than do the storage spaces like the cotyledons or the endosperm. The amt. of these acids declines during sprouting, particularly noted in the kidney bean where it occurs rapidly near the beginning of growth. The N of dicarboxylic amino acids constitutes some 3.5% of nonprotein N in the grains in ripening stage and 3.5-4.0% in ripe stage. G. M. K.

KRETOVICH, V. L.

Botanical Chemistry

"Practical manual of plant biochemistry." Reviewed by V. L. Kretovich *Biokhimiia* 17, No. 1, 1952.

9. Monthly List of Russian Accessions, Library of Congress, June 1952 ~~1952~~ Uncl.

OPARIN, A. I., Acad.; EPETOVICH, V. I.,

Grain

"Biochemistry of grain." Reviewed by N. I. Proskuryakov. Dokhizila, 17, No. 4, 1952.

9. Monthly List of Russian Accessions, Library of Congress, November 1952 1953, Uncl.

FRONTIER, V. I., GILMAN, N. S.

Palladin, Vladimir Ivanovich, 1859-1922

Vladimir Ivanovich Palladin; 30th anniversary of his death. Vest. AN SSSR 21, No. 2, 1952.

9. Monthly List of Russian Accessions, Library of Congress, July 1952 ~~1953~~, Uncl.

BUNDEL', A.A.; ZNAMENSKAYA, M.P.; KRUTOVICH, V.L.

Formation of alanine by reserve plant proteins in the presence of
ammonium pyroreacemic acid. Doklady Akad. nauk SSSR 82 no.1:109-112
1 Jan 52.
(CML 21:5)

1. Presented by Academician A.I. Oparin 2 November 1951.
2. Institute of Biochemistry imeni A.N. Bakh, Academy of Sciences USSR.

CA

11-D

Oxidation of amino acids by tissues of various plants. V. L. Kretovich and Zh. V. Uspenskaya. *Doklady Akad. Nauk S.S.S.R.* 82, 951-4 (1952).—Ten-day-old pea sprouts, ground with sand and phosphate buffer, were tested manometrically with a substrate of various amino acids by using the Warburg technique for detn. of oxidation of the latter (*C.A.* 43, 2284e). Aspartic acid is oxidized $\frac{1}{2}$ as fast as glutamic; the dicarboxylic amino acids are oxidized most rapidly at pH 6.3, and an increase in the concn. of pea-tissue suspension increases the reaction rate; max. rates occur at optimal concns. of the acids (0.05-0.1 M for glutamic and 0.045 M for aspartic acids). Etiolated pea sprouts cause much slower oxidation than green ones (factor about 1.5). Sunflower-sprout tissue has very little oxidative effect on glutamic acid. Oxidation of amino acids by the polyphenoloxidase of the sunflower in the presence of pyrocatechol gave the following descending order of oxidizability: glycine, L-glutamic acid, L-leucine, DL-methionine, DL-alanine, L-histidine, L-lysine, L-aspartic acid, L-proline, and L-tyrosine. Chlorogenic acid derived from sunflower is effective in such oxidations but its activity is less than 50% of that of polyphenoloxidase. G. M. Kosolapoff

Kretovich, V. L.

✓ Aromatic substances of red rye malt and rye bread.
V. L. Kretovich, R. M. Tokareva, I. S. Petrova, and T. V.
Drozdova. *Trudy Vsesoyuz. Nauch.-Issledovatel. Inst.
Khebopekarnoi Prom.* 1953, No. 6, 67-72; *Referat. Zhur.
Khim.* 1954, No. 36854. —The substances responsible for the
specific taste of rye bread have been investigated. The
volatile fraction of the aromatic substances obtained by
vacuum distn. consists presumably of aldehydes, since
oxidation of the rye malt by atmospheric O deprives the
malt of its specific flavor. An important component of the
volatile fraction of rye malt is hydroxymethylfurfural (I).
I is mainly responsible for the specific flavor of rye bread.
However, I is formed nearly exclusively in the bread crust.

The amt. of I in bread is directly related to the yield of
flour and the amt. of sugar in the dough, the oven temp.,
and the duration of the bread baking. Distillates from dif-
ferent samples of rye malt and bread contained mainly
AcOH and small amts. of HCOOH. E. Wierlicki

SHTAL'BERG, S.; KRETOVICH, V.

The substances responsible for the specific odor of dry-milk products.
Molochnaya Prom. 14, No.5, 27-9 '53.
(CA 47 no.15:7687 '53)

PIPER 6:4)

KRETovich, V.L. [author]; PRONIN, S.I. [reviewer]; OPARIN, A.I., akademik,
redaktor.

"Principles of plant biochemistry." Usp.khim, 22 no.7:890-892 J1 '53.
(Biochemistry) (Kretovich, V.L.) (MLRA 6:7)

KRETOVICH, V.L. [author]; OKANENKO, A.S. [reviewer].

"Principles of plant biochemistry." V.L.Kretovich. Published by "Sovetskaya
Nauka," 1952. Reviewed by A.S.Okanenko. Ukr.biokhim.zhur. 25 no.3:356-360
'53. (MLHA 6:8)

(Botanical chemistry) (Kretovich, V.L.)

KRETOVICH, J. L.

Chem Abs v48

1-25-54

Food

Melanoidin formation and color of bread crust. L. Ya. Anichman, V. L. Kretovich, E. A. Alyakrinskaya, V. M. Bazarnova, and R. R. Tokareva (A. N. Bakh Biochem. Inst. Acad. Sci. U.S.S.R., Moscow). *Doklady Akad. Nauk S.S.S.R.* 92, 131-3(1953).—When wheat grain is dried at elevated temp. (150°) the protein-proteinase system undergoes profound changes: water-sol. N, raw gluten content, and its H₂O-absorbing power decline, with almost complete inactivation of the proteinases. The bread baked from the flour prepd. from such grain has low porosity and high d., owing to poor gas retention. However, the crust of such bread is unusually light in color. This is explained by the lack of proteinase activity since this fact causes a lack of the necessary carbohydrate materials which act as raw materials for melanoidin formation which produces the normal crust color. When maltose, fructose, sucrose, and glycine were added to the deficient flour, the resulting bread had a more pigmented crust; glycine was particularly effective, and the full complement of glycine and one of the disaccharides gave normal color. Thus the color is produced by interaction of reducing sugars with products of protein hydrolysis.
G. M. Kosolapoff

KRETOVICH, V. L.

Chemical Abst.
Vol. 48 No. 9
May 10, 1954
Biological Chemistry

③
Synthesis of protein from asparagine and glutamine in wheat sprouts. V. L. Kretovich and Z. G. Evstigneeva (A. N. Bakh Biochem. Inst., Acad. Sci. U.S.S.R., Moscow). *Doklady Akad. Nauk S.S.S.R.* 93, 879-81 (1953).—When asparagine or $\text{NH}_4\text{aspartate}$ are infiltrated into wheat sprouts, protein synthesis takes place readily, although the latter substance is more readily assimilated. Asparagine is less readily assimilated than glutamine or $\text{NH}_4\text{glutamate}$. Thus glutamine and asparagine are not equiv. in protein synthesis.
G. M. Kosolapoff

Kretovich, V. L.

Chemical Abstr.
Vol. 48 No. 8
Apr. 25, 1954
Biological Chemistry

Differences in structure and chemical properties of as-
paragine and glutamine. Z. G. Kyslygnova and V. L.
Kretovich (A. N. Bakh Inst. Biochem., Acad. Sci. U.S.S.R.,
Moscow). Doklady Akad. Nauk S.S.S.R. 91, 1069-72
(1953).—The chem. properties of asparagine (I) and as-
paragine (II) are reviewed. Absorp. of absorption spectra
showed that the dihydroderivative of I shows absorption max.
at 570 mμ, as other asparagine, while the dihydrogen
deriv. of II shows no max. and displays a very broad ab-
sorption with decreasing wave length down to 200 mμ.
heating results in development of absorption max. at 570
mμ. The spectra of dihydrogen deriv. of proline and II are
identical; the yellow deriv. of II must be very similar to that
formed by proline, indicating the possible cyclic structure
of II having an amphoteric ionic nature. The blue color
obs. in the reaction of II with ninhydrin occurs not only on
heating but also under anhydrous conditions. The blue
compd. shows an absorption max. at about 600 and 600 mμ.
Thus the cyclic form appears to be stable only in the pres-
ence of O₂ and opens in the absence of O₂. Reaction of II
with xylene in aq. soln. at 60°C. gives product similar to that of I
his for asparagine, of absorption spectra is concerned,
although II gives less intensely colored products, indicating
a slower rate of reaction. G. M. Kozlovskii

[illegible]

<u>Name</u>	<u>Field of Work</u>	<u>Qualification</u>
Kratovich, V. L.	"Elements of the Biochemistry of Plants" (student manual)	Institute of Biochemistry Mendel A.I. Bath, Academy of Sciences USSR

KRETovich, V. L.

Kretovich, V. L. *Biohimiya zern* (Biochemistry of
cereals). Moscow: Inst. Biokhim. im. A.N.
Bakha, Izdatel'stvo Akad. Nauk S.S.S.R. 1954. 238 pp.
10 R. 25 K. Reviewed in *Biohimiya* 16, 510-12 (1954).

KRETovich, V. L.

USSR:

The effect of drying on the grain and the technological properties of freshly harvested wheat grain. V. L. Kretovich, A. A. Bunyat, T. I. Sotnikova, Z. N. Chudikova, S. D. Lushin, G. A. Nikulin, A. P. Gerasimov, G. A. Deburdyan, L. Ya. Anisimov, R. R. Tolstova, P. N. Korovin, V. M. Buzunova, D. A. Alodkrishev, A. D. Kulman, and N. A. Ivanitskaya. *Doklady Akad. Nauk S.S.S.R., Seriya 2*, 40-44 (1954). A detailed account is given of the investigation of alterations produced in wheat grain during air drying. Grain with moisture content up to 25% can be satisfactorily dried even at 45° (av. temp. of the grain, with the app. reaching 70°); this temp. regime not only does not spoil the seed quality but actually improves the germination and rate of growth after subsequent planting. Grain destined for bakeries and similar establishments can be dried (with moisture up to 22%) even at 120° app. temp. without spoiling the breadmaking qualities. A 2-step drying procedure tends to reduce the gluten content in the flour made from the dried grain, along with a slight decline of EtOH-sol. N. The activity of proteases in the flour rises slightly if the drying app. is kept at 110°, but a decline in the enzyme activity takes place with drying at 130°; catalase behaves similarly. G. M. Kosolapoff

KRETOVICH, V. L.

U S S R .

✓ Biochemical and technological characteristics of rye with wheat heredity. V. L. Kretovich, Ya. N. Kuprita, V. K. Karapetyan, and ~~other authors~~ N. Bakh Inst. Biochem., Acad. Sci. U.S.S.R., Moscow and Inst. Genetics, Acad. Sci. U.S.S.R.J. *Biokhim. Zhurn., Akad. Nauk N.S.S.R., Sbornik* 2, 131-0(1954).—The grains of rye, which had originated in the ears of wheat in the previous generation, have an intermediate chem. compn. between rye and wheat, the examn. being made on the basis of viscosity of aq. ext., glassiness of the grain, quality of flour and bread, and amylolytic activity. G. M. Kosolapoff

KRETovich, V.L.

U.S.S.R.

The surface films of the gliadins of rye with wheat heredity. V.L. Kretovich, G.A. Deborin, A.A. Ianchik, L.B. Gorbacheva, and A.A. Karapetyan (A. N. Bakht Int. Biochem. Acad. Sci. U.S.S.R., Moscow and Inst. Genetics, Acad. Sci. U.S.S.R.). *Biokhim. Zhurn.*, Acad. Nauk S.S.S.R., *Sbornik* 2, 140-6 (1954).--The surface films of rye grains found in wheat ears were studied. The mol. wt. of gliadin from wheat or rye is 30,000. The mol. wt. of the specimens taken from the "altered" grains is but 15,000; this material also shows significantly greater limiting area in formation of a monolayer, than is the case for the normal wheat or rye. Thus, the formation of these grains is accompanied by a severe alteration of the protein structure.

G. M. Kosolupoff

KRETZOVICH, V. L.

USSR

1. Cleavage and synthesis of amides in growing grains of corn, alfalfa, and pumpkin. V. L. Kretzovich, Z. G. Prizheva, and M. M. Melnikova. *Dokl. Akad. Nauk SSSR*, 1964, 161-78 (1964). —The seeds of the 3 plants contain amides which can cleave the amide group from asparagine and glutamine, yielding NH_3 and the corresponding amino-carboxylic acids. The cleavage of glutamine is accelerated by the presence of KCN , while no effect is produced by KCN on the cleavage of asparagine. Glutaminase has optimum pH 8.0, asparaginase 7.5. The younger sprouts have more active enzyme than the older sprouts. In etiolated sprouts of alfalfa and pumpkin, during vacuum infiltration of NH_4 and K salts of dicarboxylic amino acids, there occurs an accumulation of asparagine, especially with infiltration of NH_4 aspartate; glutamine does not show such accumulation. Synthesis of glutamine in etiolated pumpkin occurs on introduction of Na glutamate, NH_4HSO_4 , Mg ions, and Na adenosinetriphosphate (ATP). This synthesis does not proceed through reversion of action of glutaminase but through activity of ATP. Synthesis of asparagine probably takes place through synthetic activity of asparaginase and aspartate. G. M. Kosolapoff.

KRETAVICH, V. L.

U S S R .

A method for isolation of chlorogenic acid from sunflower seeds. V. L. Kretavich and Zh. V. Uspenskaya (A. N. Bakh Inst. Khim., Acad. Sci. U.S.S.R., Moscow). *Bull. Akad. Nauk S.S.R., Ser. 2*, 202-7 (1954).—Seeds (2.5 kg.) freed from husks are pressed in a hydraulic press, and the fat residue is extd. 5 times from the solids with H_2O . The air-dried solid is then extd. 3 times with hot 70% $EtOH$ for 5 min., the cooled alc. ext. is cooled and filtered, and the ppt. is discarded. The filtrate (7.1 l.) is treated with 5 ml. $Pb(OAc)_2$ (40% soln.) until cloudiness forms and the yellow-green ppt. is sepd. and discarded. The filtrate is treated with 250 ml. 40% $Pb(OAc)_2$; the yellow ppt. is centrifuged off, washed with warm 70% $EtOH$, stirred with 50 ml. H_2O , and treated with 250 ml. 5% H_2SO_4 ; the $PbSO_4$ is sepd. and the filtrate is extd. 9-10 times with 300 ml. $EtOAc$. The evapd. ext. is dried, evapd. to 50 ml., and chilled. The crude product is re-crystd. from H_2O and dried *in vacuo*, yielding 4 g. chlorogenic acid, m. 205° (cf. Carter, *C.A.* 4, 447). G. M. K.

KRETOVICH, V. L., D.R.

USSR/ Agriculture

Card 1/1 : Pub. 124 - 12/24

Authors : Kretovich, V. L., Dr. of Biol. Sc.

Title : Rational methods of grain drying in grain driers

Periodical : Vest. AN SSSR 11, 64-66, November 1954

Abstract : The development of rational methods of grain drying, especially suitable for humid regions of the USSR (Ural, Northern Kazakhstan, Siberia), is described.

Institution :

Submitted :

Kretovich, V. L.

/ The so-called reserve proteins of seeds. V. L. Kretovich, A. A. Bunkel, S. S. Melik-Sarkisyan, and K. M. Stepanovich (A. N. Sakh Inst. Biochem., Acad. Sci. U.S.S.R., Moscow). *Biokhimiya* 19, 268-67 (1974).—A method is described for the isolation of vegetable proteins which, unlike the method of T. H. Osborne, is free from protein-denaturation effects. As a consequence, the so-called reserve proteins, hitherto obtained by the Osborne method, proved to be enzymically active. The two basic principles of the new method are low temps. in the processes of extr., dilysis, and drying and a high vacuum in the freeze process. The results of studies on the so-called vegetable reserve proteins by the new method indicate that the concepts concerning these proteins formed on the basis of results obtained by the Osborne method may have to be revised. B. S. Levine

KRETovich, V.L.
KAZAKOV, Ye.D.

"Biochemistry of grain." V.L.Kretovich, ed. Reviewed by
E.D.Kazakov. Biokhimiia 19 no.4:510-512 J1-Ag '54. (MLRA 7:9)
(Grain) (Kretovich, V.L.)

KRETOVICH, V.L.

New Czechoslovak manuals on biochemical methods. Reviewed by
V.L. Kretovich. Biokhimiia 20 no.2:262-263 Mar-Apr '55; (MLRA 8:8)
(Biochemistry)

Arctovitch, V.L.

16 The synthesis of glutamic acid from α -ketoglutaric acid and ammonia in pea sprouts. V. L. Kretovich, A. A. Bundel, and V. I. Gumar (A. N. BAKHTEV, Moscow, Acad. Sci. U.S.S.R., Moscow). *Ukrain. Biochim. Zhur.* 77, 22-27 (1955) (in Russian). —Expts. were performed with 10-day old pea sprouts free from cotyledons. α -Ketoglutaric acid was synthesized according to Blaise and Gault (C.A. 5, 222) and the coenzyme was prepd. from bakers' yeast as described earlier (Biochem. Preparations 1, 28 (1949)) and its purity confirmed spectrophotometrically. Glutamic acid was detd. chromatographically by the procedure of Kretovich and Bundel (C.A. 44, 10963a). Glutamic acid is formed in the growing plant as a result of the enzymic reduction-amination of α -ketoglutaric acid by ammonia. The addn. of coenzyme and of glucose intensify the reaction for which pH 7.7 seems to be the optimum. By fractional pptn. with $(\text{NH}_4)_2\text{SO}_4$ from pea sprout exts. was isolated an enzyme prepn. which catalyzed the α -ketoglutaric acid amination process by NADH . R. S. L. (1956)

(2)

GOLIK, Mikhail Grigor'yevich, doktor sel'skokhozyaystvennykh nau, professor;
KRETOVICH, V.L., professor, doktor biologicheskikh nauk, redaktor;
GEL'MAN, D.M., redaktor; GOLUBKOVA, L.A., tekhnicheskiiy redaktor

[Storage of corn; scientific principles] Khranenie kukurusy; nauchnye osnovy. Pod red. V.L.Kretovicha. Moskva, Izd-vo tekhn. i ekon. lit-ry po voprosam mukomol'no-krupianoi, kombikormovoi promyshl. i elevatorno-skadskogo khoziaistva - Khleboisdat, 1956. 115 p.
(Corn (Maize)--Storage) (MLRA 10:3)

INIKHOV, Georgiy Sergeyevich, zasluzhennyi deyatel' nauki i tekhniki, doktor
khimicheskikh nauk; AZIMOV, G.I., retsenzent; AFANAS'YEV, P.V.,
retsenzent; GLAGOLEV, Yu.F., retsenzent; D'YACHENKO, P.F., retsenzent;
KRETOVICH, V.L., spetsredaktor; AKIMOVA, L.D., redaktor; GOTLIB, M.M.,
tekhnicheskii redaktor

[Biochemistry of milk] Biokhimiia moloka. Moskva, Pishchepromizdat,
1956. 342 p. (MIRA 10:3)
(MILK--ANALYSIS AND EXAMINATION)

KRETOVICH, Vatslav Leonovich; OPARIN, A.I., akademik, redaktor; USPENSKAYA, Zh.V., redaktor; POPRYADUKHIN, K.A., tekhnicheskii redaktor

[Fundamentals of the biochemistry of plants] Osnovy biokhimi rastenii.
Pod red. A.I.Oparina. Izd. 2-oe. Moskva, Gos. izd-vo "Sovetskaya nauka,"
1956. 497 p. (MIRA 9:12)
(Botanical chemistry)

USSR/Physiology of Plants. Respiration and Metabolism.

I-3

Abs Jour: Ref. Zhur-Biologiya, No 1, 1958, 1137.

Author : Kretovich, V.L., Prokhorovz A.P.

Inst : Central Sci Res Laboratory of the Main Administration of
State Material Reserves.

Title : Respiration of Pea and Lentil Seeds.

Orig Pub: Biokhimiya Zerna, Moskva, Akad. Nauk SSSR, 1956, 171-178.

Abstract: In the Central Scientific Research Laboratory of the Main Administration of State Material Reserves the respiration intensity of pea and lentil seeds, measured according to the quantity of CO₂ output, was determined for seeds of varying moisture content (14-18%) and at temperatures ranging from -2° to +3° and 17° - 22.5°. The intensity of respiration rose with increased moisture content of the seed, reaching a maximum at between 16 and 18%, with the temperature between 18° and 21°. With very damp seeds increasing the temperature led to greater intensity of respiration.

Card : 1/2

-1-

USSR/Physiology of Plants. Respiration and Metabolism.

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CIA-RDP86-00513R0008

200

I-3

Abs Jour: Ref. Zhur-Biologiya, No 1, 1958, 1137.

The respiration of these particular types of seed turned out to be from eight to ten times weaker than that of wheat seed. The loss in dry weight resulting from respiration was only in thousandths of a percent per year; it increased, however, with increase in temperature and moisture content of the seed.

Card : 2/2

-2-

KRETOVICH, V. L.

*Respiration and lipolytic activity of stored oil-bearing seeds. V. L. Kretovich and A. I. Starodubtseva (Technol. Inst. Food Ind. Moscow). *Dokl. Akad. Nauk. SSSR* 1956, No. 3, 179-87. The main factor which det. the storability of oil-bearing seeds is their moisture. In dry seeds the activity of biochem. processes is insignificant, increasing markedly in moist seeds. The rate of the biochem. processes, occurring during storage of oil-bearing seeds, is detd. by the moisture of the hydrophylic substances within the seeds. The process of respiration of the seeds increases with increase in moisture content of the seeds. The following crit. moisture values for oil-bearing seeds are given, above which the respiration of seeds increases: sunflower, 9, cottonseed 12.0, soybean 12.5, castor-oil bean 7.5%. The activity of lipase increases with increase in moisture of seeds. Crit. moisture for seeds with sol. lipase is 15-17%; for seeds with insol. lipase, the crit. moisture is 8.5-9%.*

Kretovich, V. L.

Antioxidants in seeds of oil-bearing cultures. V. L. Kretovich and Yu. S. Kall. *Bizhn. Zerna, Shornik* 1956, No. 3, 188-94. --Defatted flour of seeds of oil-bearing cultures (sunflower, castor bean, mustard, flax, hemp) possesses a sharply defined antioxidant capacity. The activity is concd. in the alc. and water exts. of sunflower and in water and salt exts. of hemp and flax. The antioxidant activity of the alc. and water exts. of sunflower is detd. by the presence of chlorogenic acid. Alc. solns. of chlorogenic acid, added to stored oil, inhibited increase in its peroxide no. and prevented the dehydration of the oil. Antioxidant activity of water and salt exts. of hemp and flax is detd. by the proteins present therein. Proteins of hemp and flax seeds, added to stored oil, inhibited the increase in peroxide no. and prevented the dehydration of the oil. J. A. Stekol

KRETOVICH, V.L.

Significance of D.N. Priianishnikov's works in the development of
biochemistry. Zhur.ob.biol. 17 no.3:161-168 My-Je '56. (MLRA 9:8)
(PRIANISHNIKOV, DMITRII NIKOLAEVICH, 1865-1948)(NITROGEN METABOLISM)

KRETZOVICH, V. L.

Study of the protein reserve of the soya by the ultracentrifuge method. V. L. Kretovich, T. I. Smirnova, and S. Ya. Frenkel (A. N. Bakh Inst. Biochem., Moscow). *Biochimiya* 31, 842-7 (1956).—The albumin and globulin preps. of soya cotyledons were lyophilized and then studied analytically with the aid of the ultracentrifuge. The albumin fraction consisted of a homogenous protein and a comparatively low mol. polydispersed admixt. The sedimentation const. of this component S_4 was 1.98 ± 0.003 S. The mol. wt. of the basic component was 16,000; and of the low mol. admixt. 5,000. The globulin fraction consisted of 2 sedimentation components having sedimentation coeffs. 14.0 and 8.0 S. The mol. wt. of the components was 330,000 and 126,000, resp. In the presence of cysteine the component S_4 had a longitudinal diameter for which $S = 10.7$ and its mol. wt. was 245,000. The origin of the diameter was detd. by the formation of certain highly labile bonds; when NaCl was added to the proteins dissolved in water in the presence of cysteine the protein reverted to its original state.

B. S. Loriga

KRETOVICH, V. L.

3

The role of enzymes in the rancidifying process of cereals.
V. Kretovich, M. Popov, and G. Nelyubina (Technol.
Inst. Food Ind., Moscow). *Makemel' Elevator. Prom.*
22, No. 10, 14-16(1956).—The stability of steamed and
unsteamed oatmeal and wheat meal in storage is compared.
The acid no. of the oil in oatmeal steamed 5 min. rose from
21.8 to 29.6 during a 72-day storage period, whereas the oil
of unsteamed controls rose to 163 during the same period.
With wheat meal samples steamed 5 min., acid no. increased
from 19.6 to 25.2 and in the unsteamed control from 24.0
to 44.0. Onset of rancidity in steamed and unsteamed
samples, resp., during storage was evident as follows:
oatmeal 40, 9; oatmeal gruel 72, 23; wheat meal 16, 6;
wheat-meal gruel not up to 40 days, 27 days.

15. M. Piskun

Kretovich, V.L.

713
Biosynthesis of amides in plants from N^{14} -labeled ammonia. V. L. Kretovich, Z. G. Evstigneeva, and E. G. Plyshevskaya (V. N. Bakh Biochem. Inst., Moscow) *Doklady Akad. Nauk S.S.S.R.* 169, 1001-4 (1955). -- N^{14} - NH_4Cl , used as N source in expts. with sugar beet (for glutamine synthesis), or etiolated lupine or vetch (for asparagine synthesis), in which the plant roots were immersed in the test soln. for several days, gave tracer results indicating formation of N^{14} -labeled asparagine and N^{14} -labeled glutamine. The inclusion of labeled N into glutamine proceeds more rapidly than that in asparagine. The N^{14} is found predominantly in the amide grouping. G. M. Kosolapoff

3

KRETOVICH, V. L.

"Le role de l'ammoniaque dans l'assimilation autotrophe de l'azote,"
a paper presented at the International Symposium on the Origin of Life
on the Earth, Aug 57, Moscow.

KRETOVICH, V. I.

(Inst. of Biochem, Acad. Sci. USSR)

"Enzymatic Synthesis of Glutamic Acid and Phenylalanine Plants,"

paper submitted at the 1957 International Symposium on Enzyme Chemistry held in Tokyo and Kyoto Japan, 15-23 Oct 57.

B-3,098,405 *and C, 3,018,409*

KRETovich, V. L.

filed ✓ Advances and problems in the field of food industry.
V. L. Kretovich (A. N. Bakh Biochem. Inst., Moscow).
Izv. Akad. Nauk S.S.S.R., Ser. Biol. 22, 70-83 (1957).
A review with numerous references of recent work in food
chemistry, particularly as related to grain, bread, and po-
tato products. G. M. Kozlov

KRETOVICH, V.L.; SHIRNOVA, T.I.

Oxidation and reduction as factors influencing the enzymatic activity of vegetable proteins [with summary in English]. Biokhimiia 22 no.1/2: 102-110 Ja-F '57. (MLRA 10:7)

1. Institut biokhimii im. A.N.Bakha Akademii nauk SSSR, Moskva.
(PROTEINS,

eff. of oxidation-reduction on fermentative activity of vegetable proteins (Rus))

(OXIDATION-REDUCTION, effects, fermentative activity of vegetable proteins (Rus))

Kretovich, V. L.

AUTHOR: Kretovich, V. L., Professor.

30-9-15/48

TITLE: An International Conference on the Quality of Vegetable
Foodstuffs (Mezhdunarodnyy kollokvium po kachestvu
rastitel'nogo pishchevogo syr'ya).

PERIODICAL: Vestnik AN SSSR, 1957, Vol. 27, Nr 9, pp. 85-88 (USSR).

ABSTRACT: The colloquy which was held two years ago in Geyzengeym (Heisenheim?) (FRG - Western Germany) decided to arrange for the next meeting in Paris. This second colloquy was presided over by Professor E. Terruan, the director of the French research center for vitamin problems. Professor G., Paris, reported on interesting investigations in the field of non-exchangeable amino acids in plants destined for human nourishment. The soviet delegation in its reports dealt with the problems of the biosynthesis of dicarbonic and aromatic amino acids in plant raw materials. A group of French researchers reported on the formation of amino acids in the leaves of succulents, on the combination of various plant diets for the purpose of improving the vegetarian food in Africa, on the new methods for determining the quality of organic and amino acids without a previous protein - hydrolysis. A special session was devoted to problems of the carotinoids, such as:

Card 1/2

An International Conference on the Quality of Vegetable Foodstuffs. ^{30-9-15/48}

The evolutionary biochemistry of the carotinoids of the photosynthetic tissues, the development of the accumulation of β -carotene in plant foods, and others. The Soviet delegation visited the best known biochemical and agronomical laboratories as well as a number of excellently equipped scientific institutions of Paris. The members of the Soviet delegation were especially impressed by the truly amicable obligingness of their French colleagues.

AVAILABLE. Library of Congress:

Card 2/2

KRETOVICH, V.L.

POLYANOVSKIY, O.L.; KRETOVICH, V.L.

Quantitative determination and biosynthesis of tryptophan in
plants. Dokl.AN SSSR 112 no.6:1086-1089 F '57. (MLRA 10:5)

1.Moskovskiy tekhnologicheskii institut pishchevoy promyshlennosti.
Predstavleno akademikom A.I. Oparinym.
(Tryptophan) (Biosynthesis)

Kretovich, V. L.

20-5-30/54

AUTHORS: Dalenko, N.I., Kretovich, V. L.

TITLE: On the Direct Effect Produced by Reducing Agents upon Gluten Proteins (O neposredstvennom vozdeystvii vosstanoviteley na belki kleykoviny)

PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol. 115, Nr 5, pp. 961-963 (USSR)

ABSTRACT: As is generally known, reducing agents, especially hydrosulphide compounds produce a loosening effect upon gluten. Yet there is no uniform opinion concerning the nature of this effect. Jorgensen developed the conception of the effective mechanism of the so-called baking-powders, or of the therein contained hydrosulphide compounds which activate the latent "proteinases" of flour due to which the proteolysis is intensified and a "loosening" of both the gluten and the dough is effected. This effect has also been proved experimentally, whereas Ford and Maiden came to the conclusion that glutation produces a direct effect on the gluten proteins. It is, however, quite obvious and evident that the dissolution of protein in 0,1 m acetic acid with a subsequent thorough heating

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20-5-30/54

On the Direct Effect Produced by Reducing Agents upon Gluten Proteins

at 95 to 96°C is a too drastic procedure which causes irreversible alterations of denaturization of the protein. Recently, the works by De Deken and collaborators, who had to prove the said direct influence, brought about the dissolution of "lysophilized" gluten at 0°C by pH of up to 11 in the presence of reducing substances. Under these conditions too, the irreversible fission of protein by a "milieu" of such an alkaline extent is not impossible. The sulphurous amino acids are most easily affected in this respect. The present work was performed in view of an experimental investigation of this question. Its solubility both in water and phosphate buffer, as well as its plastic properties (measured by a plastometer AB) served as indices of the physical gluten properties. The effect of the reducing agents was investigated at 0°C, this being a temperature at which the effect of proteolytic ferment seems impossible the results of the effect of the "Zystein" and of the "Askorbin"-acid upon the physical properties of the "lyophilized" gluten are given in fig. 1. This makes it clear that it seems impossible to determine the quality of the gluten by adding 0,1 to 0,001 M "Zystein" at 0°C. This is correlated with the fact that the gluten is quickly converted into a creamy substance. Only with the lowest "Zystein"-con-

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20-5-30/54

On the Direct Effect Produced by Reducing Agents upon Gluten Proteins

centration did they succeed in determining the quality of the gluten. At the same time it appears from fig. 1 that with all samples, except those to which "Zystein" was added, have been solidified.

It is thus quite obvious that "Zystin" has a direct effect upon gluten, its reaction being followed by radical changes of the gluten. The results of special tests of the same effect with different reaction of the "milieu" is given in table 2. Gluten subsequently lost all its plastic properties and was transformed into a glutinous substance independent of the reaction of the milieu. Without "Zystein" gluten solidified little by little, especially in an alkaline milieu. The results of the tests of the solubility of gluten - "lyophilized" - or of the respective protein change. The solubility of "Zystein" is substantielly changed at 0°C. Contrary to the Jorgensen-Hypothesis, it is shown in table 4 that in the case of a joint effect of "Zystein" and "Bromate" (KBr) the quantity of nitrogen passing over into the solution increases with particular abruptness which was proved by the authors by a series of tests with unique results. If, therefore,

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20-5-30/54

On the Direct Effect Produced by Reducing Agents upon Gluten Proteins

"Zystein" involves a substantial bond re-grouping of the gluten proteins by causing a radical change of its condition and of the solubility of the protein, the "Bromate" intensifies the effect of the "Zystein" and acts in this respect as a sort of synergist. There are 4 tables and 2 Slavic references.

ASSOCIATION: Moscow Technological Institute of Food Industry
(Moskovskiy tekhnologicheskii institut pishchevoy promyshlennosti)

PRESENTED: by A.I. Oparin, Academician, May 21, 1957

SUBMITTED: May 16, 1957

AVAILABLE: Library of Congress

Card 4/4

Kretovich, V. L.

AUTHORS: Kretovich, V. L., Yakovleva, V. I.

20-3-29/46

TITLE: The Synthesis of Glutamic Acid From α -Ketoglutarate in Plants.
(Sintez glyutaminovoy kisloty iz α 'fuketoglyutarata v rasteniyakh)

PERIODICAL: Doklady AN SSSR, 1957, Vol. 116, Nr 3, pp.455-458 (USSR)

ABSTRACT: Glutamic acid is one of the most movable metabolites in plants and plays a very important rôle in metabolism. Therefore the study of the ways and fermentative mechanisms of the biosynthesis and the conversion of this amino acid is of great interest. A fermentative system which catalysis the formation of glutamic acid from ketoglutar acid (hereinafter abbreviated as KG) and ammonia was discovered in pea germs. The object of the present treatise was to investigate further conditions of the process of this reaction in the vegetal organism. The descending chromatography on paper in phenol "buffered" (zabufereanny) up to pH 12,0 was applied for this purpose. The method of producing homogenates from germs and roots is described. Table 1 shows the intensity of formation of glutamic acid by aminization and superaminization ("pereaminirovaniye") of the α -ketoglutar acid. Hence it results that in the said homogenates an intensive reaction of the fermentative super aminization takes place with an increase of content of glutamic acid. Thereby the latter is formed from KG in first line at the expense of aspartic acid. Consequently an intensive syntheses-

Card 1/3

The Synthesis of Glutamic Acid From α -Ketoglutarate in Plants. 20-3-29/46

is of glutamic acid by a direct amination of KG with ammonia takes place in presence of ammonium. A noticeable increase of serin in homogenate was also essential, in which case the increase was smaller in root homogenates than in such which were produced from whole germs. Moreover the influence of kenzymase and glucose on the said synthesis was verified. The intensification of the amination process of the KG by ammonia was verified. This points out a close context of the synthesis referred to with oxidating reducing processes in the vegetable cell. Further the influence of the adenosin-triphosphor acid (ATPn) was investigated. In all cases the content of glutamic acid in the homogenat increased. Finally, growing ripe wheat-ears were investigated. Though their content of free glutamic acid is small, the KG amination process by ammonia is clearly marked. With the use of a solution of chlorammonium which was equimolar to the ammonium α -ketoglutarate in respect to ammonium, the content of glutamic acid, compared with the control, did not increase. By using sodium α -ketoglutarate, this content has even decreased. It is proved by this that the amination of the α -ketoglutarate acid takes place in pea germs and growing ripe wheat ears. There are 3 tables and 4 references, 2 of which are Slavic.

Card 2/3

The Synthesis of Glutamic Acid From α -Ketoglutarate in Plants 20-5-29/46

ASSOCIATION: Institute of Biochemistry im. A. N. Bakh of AN USSR (Institut
biokhimi im. A. N. Bakha' Akademii nauk SSSR)

PRESENTED: June 17, 1957 by A. I. Oparin, Academician

SUBMITTED: June 13, 1957

AVAILABLE: Library of Congress

Card 3/3

KRETOVICH, V. L. and USPENSKAYA, Y. ^{V.} ~~E.~~

A. N. Bach Institute of Biochemistry, Academy of Sciences, Moscow.

"Biosyntheisis of Phenylalanine in Plants."

paper preesented at Fourth International Congress of Biochemistry, Vienna, Austria
1 - 6 Sep 58.

KRETOVICH, V. L. and USPENSKAYA, Y. V. Moscow (USSR)

"Biosynthesis of Alanine in Plants."

report submitted IV Intl. Cong. of Biochemistry, Vienna, 1 - 6 Sep 1958.

KRETOVICH, Vatslav, Leonovich; OPARIN, A.I., akademik, otv.red.; ANTONYUK,
L.D., red.izd-va; SHEVCHENKO, G.N., tekhn.red.

[Biochemistry of grain and bread] Biokhimiia zerna i khleba.
Moskva, Izd-vo Akad.nauk SSSR, 1958. 172 p. (MIRA 12:2)
(Grain) (Flour)

KRETOVICH, V.L.

AUTHOR: None Given

26-58-2-35/48

TITLE: Prizes and Medals Awarded by the Academy of Sciences of the USSR (Premii i medali Akademii nauk SSSR)

PERIODICAL: Priroda, 1958, Nr 2, pp 113-114 (USSR)

ABSTRACT: The following awards were made in 1957: the prize imeni D.I. Mendeleev, to Member-Correspondent of the AS USSR, I.A. Razarnovskiy and Candidate of Chemical Sciences G.P. Nikol'skiy (posthumously) for their work "Discovery and Study of the Ozonides of Alkaline Metals"; the prize imeni A.N. Bakht, to Doctor of Biological Sciences V.L. Kretovich, for his work "Fundamentals of the Biochemistry of Plants"; the prize imeni I.I. Mechnikov, to Doctor of Biological Sciences M.A. Peshkov, for his work "Cytology of Bacteria"; the prize imeni V.L. Komarov, to Doctor of Biological Sciences A.A. Fedorov, Candidates of Biological Sciences M.E. Kirpichnikov, and Z.T. Artyushenko, for their work "Atlas to the Descriptive Morphology of the Higher Plants"; the prize imeni I.P. Pavlov, to Doctor of Medical Sciences A.I. Karapyan, for his work "The Evolution of the Functions of the Cerebellum and the Great Hemispheres of the Cerebrum"; the prize imeni P.P. Anosov, to Doctor of Technical Sciences A.I. Skakov (posthumously).

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Prizes and Medals Awarded by the Academy of Sciences of the USSR 26-58-2-35/48

for his work "Quality of RR Rails"; the gold medal imeni V.V. Dokuchayev, to Doctor of Agricultural Sciences A.A. Bode for his work "Soil Moisture". Awards were also made to Doctor of Physical-Mathematical Sciences B.K. Vaynshteyn, for his work "Structural Electronography"; Academician G.S. Landsberg (posthumously) and his fellow-workers, for their work "Basic Parameters of the Spectra of the Combination Scattering of Carbohydrates"; Doctor of Physical-Mathematical Sciences K.A. Petrzhak, Candidate of Chemical Sciences M.A. Bak, Candidate of Physical-Mathematical Sciences I.N. Semenyushkin, for their work "Isotope Content of Uranium in Meteorites"; Candidate of Geological and Mineralogical Sciences V.F. Maslov, for "Calcareous Fossil Algae of the USSR"; Candidate of Geographical Sciences N.A. Grave, for "The Conditions and Laws of Development of Strata of Permafrost Rocks in Chukotsko-Koryakskaya Country and in Kamchatka"; Doctor of Geographical Sciences L.L. Rossolimo, for "The Temperature Regime of Lake Baykal"; Doctor of Geological and Mineralogical Sciences I.L. Ginzburg, for "Elaboration of the Theoretical Bases of Geochemical Survey Methods"; Academician I.P. Bardin and co-workers, for "The Iron-Ore Basis of Ferrous Metallurgy in the USSR"; Doctor of Economic Sciences A.Ye. Irobst, Candidate of

Card 2/3

26-50-2-35/40

Prizes and Medals Awarded by the Academy of Sciences of the USSR

Technical Sciences A.I. Aleksandrova, Candidates of Economic Sciences V.B. Prodskiy, A.B. Rozentreyter and V.I. Gvayannikov, for their work "Prospects of Development of Electric Blast Furnace Production in the East of the USSR (Eastern Siberia and the Far East)".

1. Science--Citation--USSR

Card 3/3

KRETOVICH, V.L.; POPOV, M.P.; CHELEYEV, D.A.

Interaction of lipase and lipoxidase in the process of fat
oxidation. Izv.vys.ucheb.zav.;pishch.tekh. no.5:23-27 '58.
(MIRA 11:12)

1. Moskovskiy tekhnologicheskii institut pishchevoy promysh-
lennosti, kafedra biokhimii i zernovedeniya.
(Oils and fats, Edible) (Enzymes) (Oxidation)

KRETOVICH, V.L., BUNDEL', A.A., FRASHERI, M.P., BOROVIKOVA, N.V.

Competitive inhibition of transamination in plants by hydroxylamine.
Zhur.ob. biol. 19 no.5:414-416 S-0 '58 (MIRA 11:10)

1. Institut biokhimii imeni A.N. Bakha AN SSSR.
(PLANTS, EFFECT OF HYDROXYLAMINE ON)
(GLUTAMIC ACID)
(SERINE)

KRETOVICH, V.L.; SMIRNOVA, T.I.; FRENKEL', S.Ya.

Fractionation of glycinin by ultracentrifugation [with summary in English]. Biokhimiia 23 no.1:135-139 Ja-F '58. (MIRA 11:3)

1. Institut biokhimii im. A.N.Bakha AN SSSR, Moskva i Institut vysokomolekulyarnykh soyedineniy AN SSSR, Leningrad.

(PROTEINS, determination,
glycinin, ultracentrifugation (Rus)
(SOY BEAN,
same)

KRETOVICH, V.L.

Biosynthesis of dicarboxylic amino acids and enzymatic transformations of amides in plants [with summary in English]. Izv. AN SSSR Ser. biol. 23 no.2:129-143 Mr-Apr '58. (MIRA 11:4)

1. Institut biokhimii im. A.N.Bakha AN SSSR.
(PLANT PHYSIOLOGY) (NITROGEN METABOLISM)

KRETOVICH, V.L., USPENSKAYA, Zh.V.

Synthesis of phenylalanine from phenylpyruvic acid in pea seedling homogenates [with summary in English]. Biokhimiia 23 no.2:248-253
Mr-Apr '58 (MIRA 11:6)

1. Institut biokhimiia imeni A.N. Bakha AN SSSR, Moskva.
(PHENYLALANINE, metabolism
synthesis from phenylpyruvic acid in pea-seedling homogenates (Rus))
(PHENYLPYRUVIC ACID, metabolism
in phenylalanine synthesis in pea-seedling homogenates (Rus))

KRETOVICH, V.L.

International Symposium on Enzyme Chemistry in Japan. Biokhimiia
23 no.2:335-338 Mr-Apr '58 (MIRA 11:6)
(JAPAN--ENZYMES--CONGRESSES)

KRETOVICH, V.L.; SMIRNOVA, T.I.; FRENKEL', S.Ya.

Submolecular structure of glycinin and conditions of its reversible association [with summary in English]. Biokhimiia 23 no.4:547-557 J1-Ag '58. (MIRA 12:3)

1. Institute of Biochemistry (Moscow) and Institute of Higher Molecular Compounds (Leningrad), Academy of Sciences of the U.S.S.R., Moscow.

(GLOBULIN,
glycinin, submolecular structure in reversible
assoc. (Rus))

KRETOVICH, V.L.

"Manual of biological chemistry" by Simion Oeriu. Reviewed by
V.L. Kretovich . Biokhimiia 23 no.5:800 S-0 '58 (MIRA 11:11)
(BIOCHEMISTRY)

KRETOVICH, V.L.; BUNDEL', A.A.; FRASHERI, M.R.; BOROVIKOVA, N.V.

Participation of hydroxylamine in the synthesis of amino acids
in plants, Dokl.AN SSSR 122 no.6:1065-1067 0 '58.

(MIRA 11:12)

1. Institut biokhimi imeni A.N. Bakha AN SSSR, Predstavleno akademi-
kom Oparinyam.

(HYDROXYLAMINE) (AMINO ACIDS)

17(3)

AUTHORS: Kretovich, V. L., Bundel', A. A., SOV/20-122-6-30/49
Frasheri, M. R., Borovikova, N. V.

TITLE: On the Participation of Hydroxylamine in the Synthesis of
Amino Acids in Plants (Ob uchastii gidroksilamina v sinteze
aminokislot v rasteniyakh)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 122, Nr 6, pp 1065 -
1067 (USSR)

ABSTRACT: Already in 1884 (Ref 2) and in 1937 (Ref 1), respectively,
the opinion was expressed that plants during the assimilation
of nitrates form hydroxylamine which in consequence of a
later reaction with carbonyl compounds forms oximes. Accord-
ing to this hypothesis oximes are changed by reduction into
corresponding amino acids. Thus hydroxylamine together with
ammonia, which in theoretical constructions is used as an
inorganic initial compound in the synthesis of amino acids,
have become important substances. In spite of previous
papers dealing with the subject (Refs 3 - 7) the actual
participation of hydroxylamine in the synthesis of amino
acid by plants has never been demonstrated by experiment.
It was even ascertained that hydroxylamine as an intense

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On the Participation of Hydroxylamine in the
Synthesis of Amino Acids in Plants

SOV/20-122-6-30/49

intercellular toxin (kletochnyy yad) delays several processes, especially the reaction of the fermentative transamination (Ref 8). It is quite obvious that the problem of the participation of hydroxylamine investigated has to be discussed mainly with respect to the concentrations applied. The present paper aimed at investigating the participation of hydroxylamine in the synthesis of amino acid in the pulp and extracts of plant tissues. Small leaves of 10 - 12 days old wheat-seedlings and of 20 - 24 days old pumpkin-seedlings were used for this purpose. Table 1 shows the results of the experiments for the explanation of the influence exercised by hydroxylamine upon the synthesis of serine and glutaminic acid in the pumpkin-seedlings. It can be seen from table 1 that in the pulp of small leaves in the presence of hydroxylamine an intense synthesis of the serine and a distinctly marked synthesis of the glutaminic acid take place. In the pulp of wheat-seedlings the synthesis of both amino acids in question could be ascertained. However, the increase in the content of these acids in wheat and in pumpkin was different. It is difficult to explain the cause of this difference.

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On the Participation of Hydroxylamine in the
Synthesis of Amino Acids in Plants

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Finally, assumptions on the mechanism of the syntheses
discussed are expressed. There are 1 table and 14 references,
4 of which are Soviet.

ASSOCIATION: Institut biokhimii im. A. N. Bakha Akademii nauk SSSR
(Institute of Biochemistry imeni A. N. Bakh of the Academy of
Sciences, USSR)

PRESENTED: July 1, 1958, by A. I. Oparin, Academician

SUBMITTED: June 30, 1958

Card 3/3

KRETOVICH, V.L.; POLYANOVSKIY, O.L.

Tryptophan biosynthesis in the wheat ear. Izv.AN SSSR.Ser.biol.
no.3:428-430 My-Je '59. (MIRA 12:9)

1. The Technological Institute of Food Industry, Moscow.
(WHEAT) (TRYPTOPHAN)

KRETOVICH, V.L.; YEVSTIGNEYEVA, Z.G.; ASEYEVA, K.B.; SAVKINA, I.G.

Nitrogenous substances in the vleeding sap of the pumpkin [with
summary in English]. Fiziol.rast. 6 no.1:13-20 Ja-F '59.

(MIRA 12:2)

1. A.N. Bach Institute of Biochemistry of the U.S.S.R. Academy of
Sciences, Moscow.

(Pumpkin)

(Sap)

(Nitrogen)

KRETOVICH, V.L.; YAKOVLEVA, V.I.

Biosynthesis of glutamic acid and glutamine in pea and wheat
sprouts. Fiziol.rast. 6 no.2:165-170 Mr-Apr '59. (MIRA 12:5)

1. A.N.Bakh Institute of Biochemistry, U.S.S.R. Academy of Sciences,
Moscow.

(Glutamic acid) (Glutamine) (Plants--Metabolism)

KRETOVICH, V.L.; USPENSKAYA, Zh.V.

Synthesis of phenylalanine and conversion of phenylpyruvic acid
in ripening wheat ears [with summary in English]. Biokhimiia 24
no.1:116-122 Ja-F '59. (MIRA 12:4)

1. Institute of Biochemistry, Academy of Sciences of the U.S.S.R.,
Moscow.

(ALANINE)

(PYRUVIC ACID)

(WHEAT)

KRETOVICH, V.L.

Biochemistry in Poland. Biokhimiia 24 no.2:376-378 Hr-Ap '59.
(BIOCHEMISTRY, (MIRA 12:7)
in Poland (Rus))

KRETOVICH, V.L.; KAGAN, Z.S.

Biosynthesis of valine and isoleucine in ripening wheat ears.
Biokhimiia 24 no.4:717-722 J1-Ag '59. (MIRA 12:11)

1. Institut biokhimii im. A.N.Bakha AN SSSR, Moskva.
(WHEAT) (VALINE) (ISOLEUCINE)

SMIRNOVA, T.I.; POGLAZOV, B.F.; KRETOVICH, V.L.

Amperometric titration of SH-groups in glycinin. Biokhimiia
24 no.4:758-760 J1-Ag '59. (MIRA 12:11)

1. Institut biokhimii im. A.N.Bakha Akademii nauk SSSR, Moskva.
(PROTEINS chem.)
(SULFHYDRYL COMPOUNDS chem.)

YAKOVLEVA, V.I.; KRETOVICH, V.L.

Biosynthesis of glutamic acid in wheat and pea seedling homogenates.
Biokhimiia 24 no.5:842-849 S-O '59. (MIRA 13:2)

1. Institut biokhimiia imeni A.N. Bakha Akademii nauk SSSR, Moskva.
(GLUTAMIC ACID) (PLANTS--METABOLISM)

KRESTOVICH, V.L.; POLYANOVSKIY, O.L.

Tryptophan synthesis from indolylpyruvic acid in plants. *Biokhimiia*
24 no.6:995-1001 N-D '59. (MIRA 13:5)

1. Technological Institute of Food Industry, Moscow.

(TRYPTOPHAN metab.)

(INDOLINE metab.)

(PYRUVATES metab.)

17(3)

AUTHORS:

Kretovich, V. L., Galyas, E.

SOV/20-124-1-62/69

TITLE:

Synthesis of Amino Acids From Oxalacetic Acid in Sprout Extracts
(Sintez aminokislot iz shchavelevouksusnoy kisloty v ekstrak-
takh iz prorostkov)

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 124, Nr 1,
pp 217 - 219 (USSR)

ABSTRACT:

It is the aim of the present paper to investigate more thoroughly by quantitative chromatography the already earlier (Ref 1) proved synthesis of aspartic acid in homogenates from plant tissues in the presence of oxalacetic acid. This method permits the simultaneous determination of the fluctuations of the content of other amino acids. 8 - 9 days old wheat and barley sprouts were used in the experiments. Asparagine was photometrically determined by extraction (leaching out) of the spots with aqueous isopropanol (1:1). Table 1 gives the results. Herefrom can be seen that an energetic synthesis takes place in the extracts from the sprouts, as mentioned in the title. The maximum is 300% as compared to the control (water = 100%). Thus, no doubt is left that oxalacetic acid

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Synthesis of Amino Acids From Oxalacetic Acid in Germ
Extracts

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is a nitrogen-free precursor of aspartic acid in plants. At the same time a still more energetic synthesis of alanine takes place. Alanine is formed as a result of amination of pyruvate which in turn is formed by decarboxylation of oxalacetic acid. Asparagine, glutamine, γ -amino butyric acid and serine are consumed in the synthesis of aspartic acid and alanine. They are required in the transamination process. Glutamic acid was only consumed in the barley germs. Thus, the mentioned synthesis takes place by transamination of oxalacetic acid and pyruvic acid. In this connection asparagine and glutamine play an important part as sources of amino groups. The authors refer to a number of still unclarified circumstances in the above mentioned process and emphasize the points still to be clarified. There are 1 table and 12 references, 8 of which are Soviet.

ASSOCIATION: Moskovskiy tekhnologicheskii institut pishchevoy promyshlennosti (Moscow Technological Institute of Food Industry)

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17(3)

AUTHORS:

Kretovich, V. L., Yakovleva, V. I.

307/20-125-1-58/67

TITLE:

Biosynthesis of Glutamic Acid and Glutamine in a Ripening Wheat Ear (Biosintez glyutaminovoy kisloty i glyutamina v sozrevayushchem kolose psheritsy)

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 125, Nr 1, pp 210-212 (USSR)

ABSTRACT:

The authors proved that the transformations of the two substances mentioned in the title proceed in the live tissues of the germs in a completely different way as compared to the homogenates. For the experiment ears of the wheat type "Ozimaya 2453" (winter wheat 2453) were used in the stage of "lactic ripening". The ears absorbed by means of the transpiration 0.05 M solution of ammonium or potassium salt of the α -glutamic acid. The method was the same as described by references 2, 3 with some modifications. Table 1 shows the determinations of amino acids and amides in the experimental ears. Thus, it is revealed that in spite of several differences which may be due to the different ripeness of the ears and the varying weather conditions, perfectly obvious results were obtained. In connection with the introduction of the mentioned

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Biosynthesis of Glutamic Acid and Glutamine in a
Ripening Wheat Ear

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salts into the ear an intensive synthesis of glutamic acid takes place. In 3-hour-samples no transamination takes place but also a reductive amination of the α -ketoglutaric acid by the ammonium ion. In consequence of the introduction of α -potassium ketoglutarate much less glutamic acid is formed as compared with the ammonium salt of the same acid. In the case of an introduction of equimolar amounts of ammonium ions into the ears in the form of phosphate a certain synthesis of glutamic acid and an intensive glutamine synthesis take place. In this case glutamine is the compound which destroys the ammonium ions penetrating the ear. What is obvious is the accumulation of γ -amino-butyric acid in the samples with α -potassium ketoglutarate, especially in the case of an exposition of 10 hours' duration. This takes apparently place under the action of glutamine decarboxylase (Ref 5) which "carries off" the glutamic acid. Towards the tenth hour as a rule the content of glutamic acid, serine and alanine decreases. They are apparently consumed in connection with the protein synthesis. In contrast to this the content of aspartic acid increases at that time by several times its amount. It is probably less rapidly consumed

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than the other amino acids. The results obtained prove that the character of transamination in ripening ears deviates from that in homogenates where aspartic acid disappears completely, while serine and alanine are consumed to a considerable extent. In this connection a new confirmation was established of the fact that glutamine plays a particular part (Refs 6, 7) as a very unstable substance in connection with the binding of the running in ammonia (beside glutamic acid) and the transference of the amino groups to the keto acids during transamination. Further, it became obvious that in the ripening ears a very close connection exists between the metabolism of glutamic acid, glutamine and γ -aminobutyric acid. This interaction is explained by means of a scheme. The data given by the authors are in accordance with those of reference 8. There are 1 table and 8 references, 5 of which are Soviet.

ASSOCIATION: Institut biokhimii im. A. N. Bakha Akademii nauk SSSR
(Institute of Biochemistry imeni A. N. Bakh of the Academy
of Sciences, USSR)

Card 3/4

PONOMAREVA, A.N.; KRETOVICH, V.L.

Quantitative determination of free amino acids in grain and
flour. Izv.vys.ucheb.zav.; pishch.tekh. no.1:132-134 '60.
(MIRA 13:6)
1. Kafedra biokhimii i zernovedeniya Moskovskogo tekhnologi-
cheskogo instituta pishchevoy promyshlennosti.
(Amino acids)

KRETOVICH, V.L.; YAKOVLEVA, V.I.

Biosynthetic production of glutamic acid. Izv. AN SSSR. Ser.
biol. no.2:197-205 Mr-Apr '60. (MIRA 13:6)

1. Institute of Biochemistry, Academy of Sciences of the U.S.S.R.,
Moscow.

(GLUTAMIC ACID) (BIOSYNTHESIS)

KRETOVICH, V.L.; PROKHOROVA, A.P.

Biochemical characteristics of grain possessing different flavors.
Izv. AN SSSR. Ser. biol. no.3:446-450 My-Je '60. (MIRA 13:7)

1. Institute of Biochemistry, Academy of Sciences of the U.S.S.R.,
Moscow.

(GRAIN--ANALYSIS AND CHEMISTRY)